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NOTES ON A SMALL COLLECTION OF LIPARID  
FISHES FROM THE YELLOW SEA

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Through the courtesy of Mr. Merrill Newman, I have had at my disposal several liparid fishes collected by him in May of 1953 on the west coast of Korea. The specimens herein reported were trawled at a depth of five to eight fathoms off Chodo Island, approximately 38° 30' N. latitude, 124° 15' E. longitude. The material has been deposited in the Natural History Museum of Stanford University.

The purposes of this paper are four: 1. Describe an apparently unknown form. 2. Give a second record of *Liparis choanus* and extend its known range to the eastern shores of the Yellow Sea. 3. Describe the only known male of *L. choanus*. 4. Confirm the observations of Abe (1950, 1955) that some species of *Liparis* lack posterior nostrils.

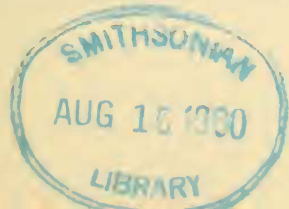
Counts on vertebrae, dorsal fin rays and anal fin rays have been taken from X-rays.

***Liparis newmani* new species**

*Holotype*: S.U. 53270, 55.6 mm in standard length.

*Diagnosis*: A *Liparis* with two nostrils, the dorsal and anal connected to the caudal, the dorsal lacking a notch, the pectoral with a notch, the gill slit extending down in front of seven pectoral rays and with a greater number of pectoral rays than dorsal rays.

*Counts and measurements*: Measurements in millimeters first, followed by percent of standard length in parentheses. Greatest body depth 12.4 (21.4); width of body at level of anal fin origin 6.5 (8.9); greatest head width 14.5 (25.0); head length 16.6 (28.6); eye 2.8 (4.8); snout length 7.0 (12.1); disc length 6.5 (8.6); disc width 5.0 (9.0); interorbital 7.9 (14.2); gill slit 4.8 (7.2); posterior edge of disc to vent 6.4 (11.5); snout to posterior tip of pectoral fin 27.0 (48.6); dorsal 42; anal 35; pectoral 46,



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counted on the right fin; vertebrae 45, not including urostyle; branchiostegals 6.

*Description:* A slender fish with the greatest body depth immediately behind the head, 4.5 in standard length. Body compressed, deeper than wide, even at the widest point behind the head. Viewed from above or below, body tadpole-shaped, broad anteriorly, strongly compressed behind the level of the anal fin origin. Skin smooth, lacking prickles.

Dorsal fin origin a short distance behind a vertical from the posterior edge of the opercle. Dorsal fin not notched. Dorsal and anal fins connected with the caudal fin to about the middle of the caudal fin length. Distance from vent to origin of anal fin 4.9 in head. Pectoral fin notched, fifteenth ray from the bottom at the apex of the notch. The disc is longer than it is broad. Caudal fin rounded.

The head is broader than it is deep in the opercular region. Viewed dorsally it curves to the broadly-rounded snout. Viewed laterally the tip of the snout is a blunt, almost vertical area. Eye relatively large, 5.9 in head, with a rounded pupil. Nostrils paired, the anterior tubular, the posterior a raised pore. The distance between the two nostrils is equal to the vertical diameter of the eye. The posterior nostril is in line with a vertical from the anterior margin of the eye.

Premaxillary with six to eight oblique rows of tricuspid teeth which are progressively larger towards the posterior margin of the bone. Dentary with about six oblique rows of tricuspid teeth arranged as in the upper jaw. Each pharyngeal carries a broad pad of pointed teeth which oppose smaller but similar pads in the floor of the mouth. The gill rakers are modified into small dentigerous knobs. Gill opening moderate, 3.5 in head, extending down to level of seventh pectoral ray.

Body and head reddish-brown, skin fairly transparent, with many small, brown chromatophores. Pigment cells unevenly distributed on dorsal and anal fins giving them a variegated appearance. Two narrow, irregular, brown bands across the basal half of the caudal. Ventral part of fish in front of anal fin a uniform reddish-brown, lacking spots. Pectorals with a few scattered chromatophores, more thickly distributed dorsally.

*Relationships:* This species is apparently most closely related to *L. agassizi* of northern Japan, to which it keys out in Burke's (1930: 56) key to the genus. It differs most strikingly from *L. agassizi*, and indeed from any other known *Liparis*, in its high pectoral ray count, 46 in *L. newmani* compared to 32 to 42 in *L. agassizi* (based on counts by the author on 22 specimens in the U. S. National Museum). Another difference is in the color: Burke (1930: 77) gives four types of coloration, none of which is similar to *L. newmani*. Finally, the skin of *L. newmani* is more transparent than the skin of any specimens of *L. agassizi* I have examined.

*Liparis multiradiatus* is similar in its high fin ray counts, unnotched dorsal, notched pectoral and attached dorsal and anal fins but has more dorsal rays than pectoral rays, a larger eye (7.0 percent of standard length), a larger gill slit (9.8 percent of standard length) and other differences (see Matsubara and Iwai, 1954: 437).

I have also considered the possibility that my specimen may represent a young example of *Liparis tanakae*, a species which has been recorded from Chefoo on the Yellow Sea (Wu and Wang, 1933). In writing of Japanese and Korean material, Burke (1930: 87) states: "Pectoral fin unnotched in the adult, possibly slightly notched in the young." The pectoral of *L. newmani* is definitely notched. Some differences from Wu and Wang's description of Yellow Sea *L. tanakae* are a longer head (3.4 in standard length for *newmani*, 3.7 to 4.3 for *tanakae*), shorter snout (4.2 in head for *newmani*, 2.3 to 2.9 for *tanakae*), and larger eye (5.9 in head for *newmani*, 7.0 to 9.5 for *tanakae*). Unfortunately, the smallest specimen which they report is 180 millimeters in total length, so that differences in proportions may not be significant. Other differences are in coloration, Wu and Wang state immature fishes are grey; and in pectoral ray counts, they state 40 to 42. In addition, their figure shows a specimen with a much blunter head than in *L. newmani*.

*Liparis choanus* Wu and Wang

*Liparis choanus* Wu and Wang, 1933, p. 83, Figs. 5 and 6 (orig. descr., two spec. Chefoo, two spec. Tsingtau).

*Study material:* A male, 90.2 mm in standard length; a female, 85.0 mm in standard length.

*Counts and measurements:* Measurements in percent of standard length, given for the male first followed by the female in parentheses. Greatest body depth 24.8 (21.1); width of body at level of anal fin origin 9.4 (8.5); greatest head width 24.3 (24.9); head length 24.4 (27.1); eye 4.2 (3.6); snout length 8.3 (8.2); disc length 8.6 (9.4); disc width 8.3 (9.4); interorbital 9.5 (9.4); gill slit 8.3 (7.8); posterior edge of disc to vent 6.1 (9.0); tip of snout to posterior tip of pectoral fin 39.6 (41.9); dorsal 37 (35); anal 31 (30); pectoral 37-35 (37-37); vertebrae 39 (40), not including urostyle; branchiostegals 6.

*Sexual dimorphism:* The most striking difference between the two sexes is the presence of typical, *Liparis*, thumb-tack prickles on the male. They are abundant over the sides of the body and on the vertical fins, sparse and small on the upper lobe of the pectoral fin, and absent on the body median to the pectorals and on the venter. The dorsal region of the fish from the interorbital area to the anterior part of the dorsal fin has only scattered prickles but bears a profusion of small fleshy protuberances which give the entire area a rugose appearance. The female has smooth skin.

The male has proportionally longer dorsal and anal fin rays than does the female.

The male has a proportionally shorter disc to anus distance than does the female.

Both sexes have a small papilla behind the vent; however, that of the male is slightly larger and has the tip directed posteriorly. The papilla of the female is surrounded by a number of irregular folds which are absent in the male.

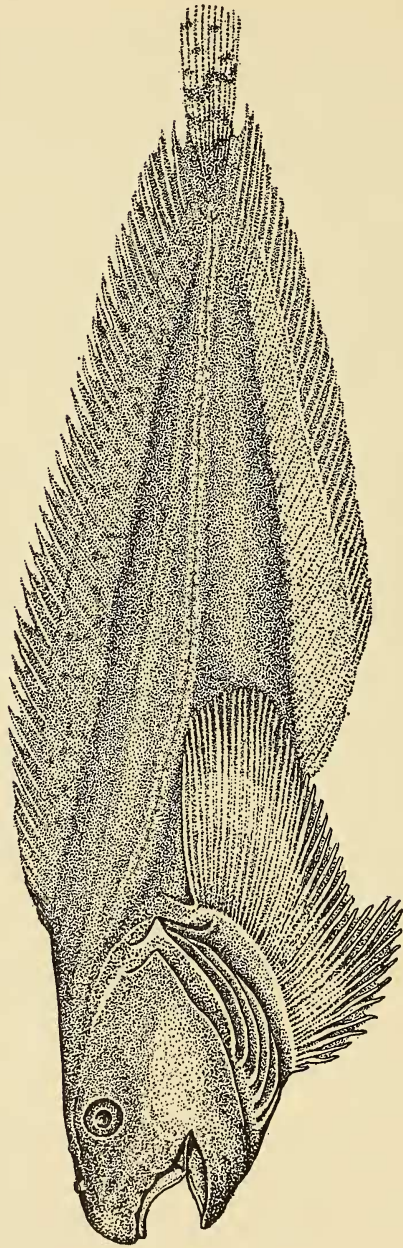


FIG. 1

The specimens at hand agree with the color pattern described for the type material and shown in the figure, with the exception that my material is reddish-brown rather than silvery. Wu and Wang (1933: 81) also describe *Liparis chefuensis*, a species which is reddish and has prickles but in most other respects seems similar to *L. choanus*. *L. chefuensis* was described from five specimens ranging from 120 to 155 mm total length, sex not given; *L. choanus* from four females, 92 to 110 mm total length. I refer my two specimens to *L. choanus* chiefly on the basis of greater similarities in proportions; however, it may well be that *L. choanus*, as described by Wu and Wang, is based on smaller females of *L. chefuensis*.

*Nostrils*: Many authors who have dealt with the genera of liparid fishes have utilized the presence of two pairs of nostrils to characterize the genus *Liparis*, although Burke (1930: 43) notes the posterior nostril is reduced in some species. More recently, Abe (1950, 1955) has described species which appear to be typical *Liparis* but lack posterior nostrils. A similar situation exists in *L. choanus*. The anterior nostril is present as a prominent, raised tube. The posterior nostril is present only as a very small, fleshy bump which has no opening. In their short diagnosis of the genus *Liparis*, Wu and Wang (1933: 80) state "Nostrils 2." However, in their descriptions of both *L. chefuensis* and *L. choanus* they mention only the tubular nostril.

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#### EXPLANATION OF FIGURE

Fig. 1. Holotype of *Liparis newmani*, 55.6 mm in standard length. Drawn by Mildred H. Carrington.